

rotor and housing interior having a clearance therebetween; a shear edge disposed adjacent said clearance in the downstreammost portion of said inlet, in said direction of rotation; and said shear edge mounted so that it is readily replaceable; and
a comminuted cellulosic fibrous material treatment vessel operatively connected to said outlet to receive comminuted cellulosic fibrous material from said outlet.

REMARKS

Enclosed herewith are two of the sheets of drawing marked up in red to indicate a change (in figure 5) to remove a reference numeral not discussed in the specification, and -- in figure 2 -- to illustrate schematically what was already described in the application specification page 11.

By the present amendment the informality pointed out in paragraph 8 on page 4 has been corrected.

Reconsideration is respectfully requested of the restriction requirement. All three sets of claims relate to the same inventive concept, ready replacement of a shear plate in a conventional star feeder in a pulp mill so as to solve a number of problems inherent in the prior art. In order to more clearly delineate that there is insufficient distinctness to require restriction independent claims 12 and 17 have been amended.

Amended claim 12 specifically calls for the operation of the star feeder so as to feed comminuted cellulosic fibrous material from the inlet to the outlet thereof, the same limitation that is provided as in claim 1 and allegedly the distinguishing limitation between Groups I and II as set forth in paragraph 2 on page 2 of the Action. Since the alleged distinction between the claims of Groups I and II set forth in the previous Action

no longer exists, it is believed that the claims of Groups I and II clearly must be examined together.

With respect to paragraph 3 on page 2 of the Action, claim 17 has been amended to specifically call for connection of the star feeder assembly to a treatment vessel for comminuted cellulosic fibrous material. Thus the apparatus of claim 17 cannot be used to practice a materially different process than is set forth in claim 1, such as feeding grain, but rather only can be used to feed comminuted cellulosic material. Therefore there is insufficient distinctness between the method and apparatus claims, and all of the claims should be examined together.

Though this restriction requirement is traversed simply as a formality applicant confirms the election of claims 1 through 11, but this election is without waiving the right to petition the restriction requirement if maintained.

Reconsideration is respectfully requested of the rejection of claims in paragraph 10 on page 4 of the Action as obvious over the Continuous Digesters publication in view of Granite. Even if the references are combined the claimed invention does not ensue and further there clearly and unequivocally is no *prima facie* case of obviousness.

In the pulping industry, star-type rotary feeders are often used to convey material, for example, wood chips (or other types of comminuted cellulosic fibrous material), from one vessel to another, or from one set of process conditions to another. For example, such feeders are typically used to transfer chips from one pressurized state to another, typically, from a lower to a higher pressurized state. Conventional star-type feeders, for example, those sold by Ahlstrom Machinery of Glens Falls, NY

and serviced by Ahlstrom Services, of Pell City, Alabama, typically comprise pocketed rotors mounted for rotation within a cylindrical housing, which is exactly what is illustrated in the "Continuous Digesters" reference applied. The housing typically contains two or more openings or ports which accept chips under one set of process conditions, for example, pressure or temperature, and discharge chips under a different set of process conditions. The rotors typically comprise two or more pockets or cavities which communicate with the openings in the housing to accept chips introduced at one opening and are then transferred by rotation to the housing discharge opening. Typical star-type feeders include those sold under the names Airlock Feeder, Chip Meter, Low Pressure Feeder, or High Pressure Feeder, among other types of devices.

Since these star-type feeders are designed to transfer material from one set of process conditions to another, they are also designed to isolate the process conditions, that is, prevent leakage of liquids and gasses, between one state and another state. For this reason, the clearance between the outside diameter of the rotor and the inside diameter of the housing is typically tightly toleranced, and closely monitored and controlled to ensure that as little leakage as tolerable by the process occurs.

However, the material being transferred, for example, hardwood or softwood chips, in a dry, steamed or slurried state, makes it difficult to maintain the tight clearances without making some accommodation for the effect the rigid chips, or tramp material (such as stones, sand, nuts and bolts) can have upon the surfaces that define the clearance between the rotor and the housing. The surfaces of both the rotor and the housing, especially the leading edges exposed to the openings (especially the inlet)

in the housing, can become worn or damaged during operation. This damage can increase the clearance between the running surfaces and result in increased leakage of process fluids. Damaged surfaces or debris can also increase the friction between the running surfaces and result in increased electrical loads on the motor or drive train turning the rotor.

Conventionally, the leading internal edge of the housing that confronts the material as it is transferred by the rotation of the rotor is critical to preventing the lodging of material between the inner surface of the stationary housing and the outer surface of the rotating rotor. This edge is typically designed and then monitored to minimize the possibility of material entering the clearance between the rotor and housing. The edge is typically given a sharp contour that acts to shear any outer material that is carried by the pocket of the rotor into the housing, and is commonly referred to as a "shear edge". The "shear edge" is typically a machined edge to ensure a sharp, clean contour. The feeder housing is typically cast, for example, cast in stainless steel, and this shear edge is machined at the same time the internal surface of the housing is machined to provide the desired clearance between the housing and the rotor. In order to further protect this shear edge, star-type feeders, for example, a Low Pressure Feeder, may also include a protective baffle positioned above the shear edge to prevent large particles from impacting and damaging the shear edge. This baffle, typically referred to as a "doctor blade" (though it does not act as a conventional doctor blade, for example, as used to doctor pulp from a rotating drum cylinder) is typically welded separately to the housing inlet.

Conventionally, star-type feeders have limited service life before the external surface of the rotor or the internal surface of the housing becomes sufficiently damaged that one or both surfaces need to be replaced, repaired, or "re-built". For example, at Ahlstrom Services, a "rebuild" typically comprises "overlaying" either damaged surface with weld material and then machining the overlaid weld material to the desired dimensions. Due to the exposure of the shear edge and its potential to be damaged during operation, the shear edge of the housing is typically more prone to damage. It is frequently damage to this shear edge, and sometimes this shear edge alone, that necessitates a rebuild of a feeder. For example, in one pulp mill the life of a Low Pressure feeder was limited to only 6 to 8 months due to excessive damage to its shear edge.

According to the invention it has been recognized that since the shear edge of a feeder is prone to such accidental damage, that providing a feeder -- such as shown in the Continuous Digesters reference applied -- with a shear edge that is readily replaceable can extend the service life of a feeder so that fewer rebuilds are necessary. In addition a more easily replaceable shear edge can provide less "down time" by the pulp mill in order to service the feeder. In fact according to a commercial use of the present invention, a conventional star feeder which had a service life of between six and nine months before significant down time was necessary has now exceeded 16 months of operation without requiring significant down time. Although this increase in service life is not exclusively attributable to the use of the replaceable shear edge, that

has been one important factor in extending the service life before there is significant down time.

The method of claim 1 solves the problems identified above in a simple and effective manner. When the shear edge is worn to approximately the point that excess leakage occurs or is substantially imminent, the shear edge is replaced with a new shear edge while the practice of the conventional feeding, rotating, and discharge steps is temporarily interrupted. Neither the Continuous Digesters reference nor Granite teaches step (d) of independent claim 1.

The Continuous Digesters publication merely shows the prior art over which the invention is an improvement. The Continuous Digesters publication does not recognize the source of the problem according to the claimed invention, nor provide any solution. Rather it merely illustrates the background prior art.

The Granite reference is totally irrelevant to the claimed invention and is completely non-analogous art. All that Granite teaches is the concept of replaceable cooperating tooth rotary blades 46 cooperating with replaceable tooth stationary blades 35. The toothed blades of Granite have no relationship whatsoever to a shear edge in an inlet of a star feeder, or replacing the shear edge when it is "worn to approximately the point that excess leakage occurs or is substantially imminent" as is recited in step (d) of claim 1. The whole purpose of the intermeshing teeth 47 and 36 on the rotor and stationary blade (see column 3, lines 53+) is to fit as closely as possible so as to effect chopping of polymers and "particularly elastomeric materials such as tires" (see Abstract, lines 1 and 2) into uniform small size particles. Granite has no indication

whatsoever of replacing any element thereof when there is "leakage" or substantially imminent "leakage", and even the concept of "leakage" does not appear to be relevant to Granite.

Not only do the Continuous Digesters publication and Granite not teach step (d) of claim 1 even if combined, there clearly and unequivocally is no *prima facie* case of obviousness for a number of reasons.

In determining the propriety of a rejection under 35 USC §103, it is well settled that the obviousness of an invention cannot be established by combining the teachings of the prior art absent some teaching, suggestion or incentive supporting the combination. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596, 1598, 1599 (Fed. Cir. 1988); *Ashland Oil, Inc. v Delta Resins and Refractories, Inc.*, 776 F.2d 281, 227 USPQ 657 (Fed. Cir. 1985); *ACS Hospital Systems, Inc. v Montefiore Hospital*, 732 F.2d 1572, 221 USPQ 929 (Fed.Cir. 1984). The law of the Federal Circuit is that "[a] *prima facie* case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person or ordinary skill in the art." *In re Rinehart*, 531 F.2d 1048, 1051, 189 USPQ 143, 147 (CCPA 1976), emphasis added. See also *In re Lalu*, 747 F.2d 703, 705, 223 USPQ 1257, 1258 (Fed. Cir. 1984) ("In determining whether a case of *prima facie* obviousness exists, it is necessary to ascertain whether the prior art teachings would appear to be sufficient to one of ordinary skill in the art to suggest making the claimed substitution or other modification." (emphasis added)).

Here there is no *prima facie* case of obviousness because neither of the references recognize the source of the problem according to the present invention, nor suggest its solution. Both of these must be considered when evaluating patentability, as made clear by *In re Spinnoble*, 160 USPQ, 237, 243 (CCPA 1969), wherein the Court held:

"It should not be necessary for this court to point out that a patentable invention may lie in the discovery of the source of a problem even though the remedy may be obvious once the source of the problem is identified. This is part of the 'subject matter as a whole' which should always be considered in determining the obviousness of an invention under 35 USC 103. *In re Antonson*, 47 CCPA 740, 272 F.2d 948, 124 USPQ 132; *In re Linnert*, 50 CCPA 753, 309 F.2d 498, 135 USPQ 307. The court must be ever alert not to read obviousness into an invention on the basis of the applicant's own statements; that is, we must view the prior art without reading into that art appellant's teachings. *In re Murray*, 46 CCPA 905, 268 F.2d 226, 122 USPQ 364; *In re Sporck*, 49 CCPA 1039, 301 F.2d 686, 133 USPQ 360. The issue, then, is whether the teachings of the prior would, in and of themselves and without the benefits of appellant's disclosure, make the invention as a whole, obvious. *In re Leonor*, 55 CCPA 1198, 395 F.2d 801, 158 USPQ 20." (Emphasis added)

Where, as here, the references are not concerned with the same proximate problem as the invention (let alone recognize its source) there can be no *prima facie* case of obviousness. See *In re Pye*, 148 USPQ 426, 429 (CCPA 1966) wherein the Court held:

"While, as an abstract proposition, it might be possible to select certain statements from Fikentscher and mechanically combine them with Touey to arrive at appellants' claimed combination, we find absolutely no basis for making such a combination. Neither reference is directed to the problem solved by appellants' invention, namely developing a cleaning composition for the skin having improved lubricity characteristics. In our view, only appellants' specification suggests any reason for combining the teachings of the prior art but use of such suggestion is, of course, improper under the mandate of 35 USC 103. *In re Shaffer*, 43 CCPA 758, 229 F.2d 476, 108 USPQ 326." (Emphasis added.)

Further, the teachings of the references even if combined do not suggest the

advantages achievable according to the invention. These advantages include enhanced operation of a pulp mill without significant "down time" because of the star feeder (one of only many components thereof), and the other advantages discussed above. Where the art does not recognize the advantages achievable according to the invention there can be no *prima facie* case of obviousness. *In re Gordon*, 221 USPQ 1125, 1127 (Fed. Cir. 1984):

"We are persuaded that the board erred in its conclusion of *prima facie* obviousness. ... The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification."

Further the teachings of Granite are specifically contrary to the invention, and Granite if used with the Continuous Digesters publication device would render the Continuous Digesters publication device inoperable for performing its intended function. Of course it can never be considered obvious to do this. See *Hughes Aircraft v United States*, 215 USPQ 787, 804 (Ct. Cl. 1982), relevant portions affirmed 219 USPQ 473 (Fed. Cir. 1983), wherein the Court held:

"Furthermore, it is generally settled that a change in a prior art device which makes the device inoperable for its intended purpose cannot be considered to be an obvious change.....In the case at bar, it is clear that if the McLean space vehicle were modified as suggested it would no longer be capable of performing its intended target-seeking function. Thus, the suggested changes are not obvious changes."

Also see *Ex parte Thompson*, 184 USPQ 558, 559 (Bd App 1974), wherein the Board held:

"The appellant notes that the central theme of the Ericson disclosure is a ceiling grid with controlled ventilation which is obtained by slotting all of the

runners and by providing in association therewith apertured slide plates. The appellant also notes that Ericson teaches that the slide plates be located on the ceiling sided of the grid, that they be an integral part of the runner structure, i.e., not removeable without breaking or at least disassembling the runner, and that the slide plates be moveable between fully opened and closed limit positions. It is the appellant's position that it would not be obvious to substitute the non-apertured strips of Klein for the apertured slide plates of Ericson, since to do so would destroy the Ericson apparatus for its intended purpose. We agree with the appellant's position and, thus, we do not sustain the rejections of the appealed claims." (Emphasis added.)

In this case the Granite reference relates to chopping of elastomeric materials like tires. The whole purpose is to form the tires into small pieces. However the mechanical maceration (chopping up) of wood chips or like comminuted cellulosic fibrous material as set forth in claim 1 would grossly adversely affect the properties of the final paper pulp produced. This includes the paper strength. That is if one were to use the macerating device of Granite in place of the star feeder of the invention the end product produced would be of much lower, and unacceptable for the intended purposes, quality.

Therefore claim 1 clearly patentably distinguishes from the art.

The dependent claims even more clearly distinguish. Claim 2 calls for step (d) to be practiced by removing fasteners and replacing the entire shear edge and holding the replaced shear edge in place with the fasteners. There is no teaching in Granite of replacing the shear edge such as recited in claim 2. Also there is no even the remote suggestion of a removable protective baffle in the references, let alone the particular steps recited in claims 6 and 7. Nor is there even the most remote suggestion of adjustment of a shear plate as is recited in claims 10 and 11, let alone the particular

details thereof. Therefore all of the claims rejected in paragraph 10 on page 4 of the Action are clearly patentable.

Reconsideration is also respectfully requested of the rejections in paragraphs 11 and 12 on page 5 of the Action adding the Chafee or Buboltz references. Neither Chafee or Buboltz remedy the deficiencies of the primary references as far as teaching what is in claim 1 is concerned, therefore for this reason alone even if the references are combined the claimed invention does not ensue, and there is no *prima facie* case of obviousness. Further Chafee and Buboltz are also completely irrelevant to the claimed invention and relate to non-analogous prior art.

Chafee does not recognize the problem solved according to the present invention, and has nothing to do with handling comminuted cellulosic fibrous material. Of course the material recited in the claims must be given weight when considering patentability. See *Ex parte Leonard*, 187 USPQ 122, 124 (Bd App, 1974):

"Our reversal of the rejection of method claim 22 is additionally based on a line of decisions requiring that the materials on which a process is carried out be accorded weight in determining the obviousness of that process. *In re Mancy*, 499 F.2d 1289, 182 USPQ 303 (CCPA 1974); *In re Wadinger*, 496 F.2d 1200, 181 USPQ 826 (CCPA 1974); *In re Schneider*, 481 F.2d 1350, 179 USPQ 46 (CCPA 1973) and *In re Kuehl*, 475 F.2d 658, 177 USPQ 250 (CCPA 1973)."

This was also recognized in the last sentence in paragraph 3 on page 2 of the Action where it was indicated that a materially different process would result if another material were handled aside from comminuted cellulosic fibrous material.

Chafee uses a cutting device for "dicing or cutting plastic" (see the Abstract). The dicing and cutting action of Chafee not only is non-analogous to the claimed invention if it were employed in the Continuous Digesters publication star feeder it

would render the conventional star feeder therein incapable of producing pulp with the quality necessary. Further there is absolutely no suggestion whatsoever of the particular method steps set forth in claims 3 through 5 in Chafee. The mere fact that Chafee shows cutting blades having different components does not provide any suggestion whatsoever of the specific features set forth in these claims, and it is impermissible to ignore these features in the name of obviousness. See *In re Wilson*, 165 USPQ 494, 496 (CCPA 1970) wherein the Court held: "All words in a claim must be considered in judging the patentability of that claim against the prior art."

Buboltz too has nothing to do with handling comminuted cellulosic fibrous material, but rather relates to an agricultural combine, which does not deal with the same problem, nor solve it, of the invention, and does not have the advantages achievable according to the invention. Nor does Buboltz teach the specific step (d) in claim 8 since Buboltz does not show a shear edge but rather double edged cutting knives 14. Applicant is not attempting to patent the general concept disclosed in column 4, lines 48 through 52 of Buboltz, but rather is solving a particular problem in a totally non-analogous art.

With respect to all of the obviousness rejections, none of Buboltz, Chafee, or Granite are effective prior art for the claimed invention since they are completely non-analogous. See *In re Oetiker*, 977 F.2d 1143, 1147, 24 USPQ2d 1143, 1145, 1146 (1992), wherein the Court held:

"In order to rely on a reference as a basis for rejection of the applicant's invention, the reference must either be in the field of the applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned. See *In re Deminski*, 796 F.2d 436, 442, 230 USPQ

313, 315 (Fed. Cir. 1986). Patent examination is necessarily conducted by hindsight, with complete knowledge of the applicant's invention, and the courts have recognized the subjective aspects of determining whether an inventor would reasonably be motivated to go to the field in which the examiner found the reference, in order to solve the problem confronting the inventor. We have reminded ourselves and the PTO that it is necessary to consider 'the reality of the circumstances', *In re Wood*, 599 F.2d 10-32, 1036, 202 USPQ 171, 174 (CCPA 1979) -- in other words, common sense -- in deciding in which fields a person of ordinary skill would reasonably be expected to look for a solution to the problem facing the inventor.

It has not been shown that a person of ordinary skill, seeking to solve a problem of fastening a hose clamp, would reasonably be expected or motivated to look to fasteners for garments. The combination of elements from non-analogous sources, in a manner that reconstructs the applicant's invention only with the benefit of hindsight, is insufficient to present a *prima facie* case of obviousness. There must be some reason, suggestion, or motivation found in the prior art whereby a person of ordinary skill in the field of the invention would make the combination. That knowledge cannot come from the applicant's invention itself."

Here, as in *Oetiker*, there is insufficient reason, suggestion, or motivation from the tire chopping, plastics chopping, or combine arts to provide anything useful to the pulp and paper art. Therefore for this reason too there is clearly no *prima facie* case of obviousness.


Independent claims 12 and 17 have the same distinguishing features over the references as does claim 1, there being absolutely no teaching whatsoever of step (d) of claim 12, let alone steps (b) and (c) thereof, nor is there any teaching of the particular shear edge mounted so that it is readily replaceable in the pocketed rotor associated with a comminuted cellulosic fibrous material treating vessel as set forth in claim 17. Therefore all of the claims clearly patentably distinguish from the art and early passage to issue is earnestly solicited.

BOWLING et al
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Should any small matters remain outstanding it is requested that the undersigned attorney be given a call so that such matters may be worked out and the application placed in condition for allowance without the necessity of another Action and amendment.

Respectfully submitted,

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